

NOAA's National Weather Service

Ron Riemersma

Basic Concepts of *Severe Storm Spotting*

2012 – Rusty Kapela

Milwaukee/Sullivan

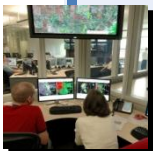
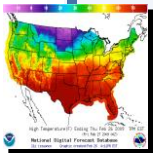
www.weather.gov/mkx

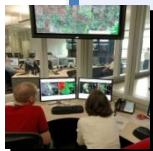
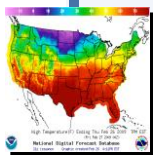
rusty.kapela@noaa.gov



Housekeeping Duties

- **How many *new* spotters?** - first spotter class & you want to be a spotter? – please raise your hand.
- Representative at each location – get the beancounts and email them to rusty.kapela@noaa.gov
- **Spotter Slide Sets** on the SkyWarn Page on the Milwaukee/Sullivan web site. www.weather.gov/mkx
- **Utilize search engines and You Tube** for videos. Caution – some material labeled incorrectly!





National Weather Service
Protecting Lives and Property

-
- High Temperature Forecasting: Feb. 26 - Mar. 4
 40° 50° 60° 70° 80° 90° 100° 110° 120°
- National Digital Forecast Database
 24 hours: 1999-03-01 12:00 UTC



Why Are We Here?



National Weather Service's role

- *Issue warnings & provide training*

MASA & MidWest SSTRC's role

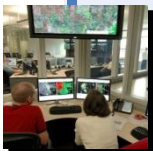
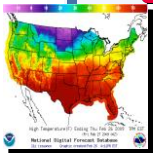
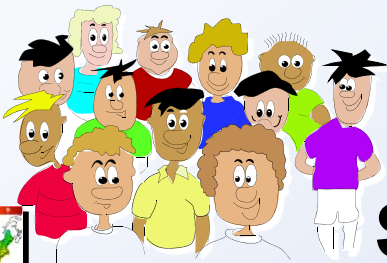
- *Assist NWS & provide training (community outreach!)*

Spotter's role

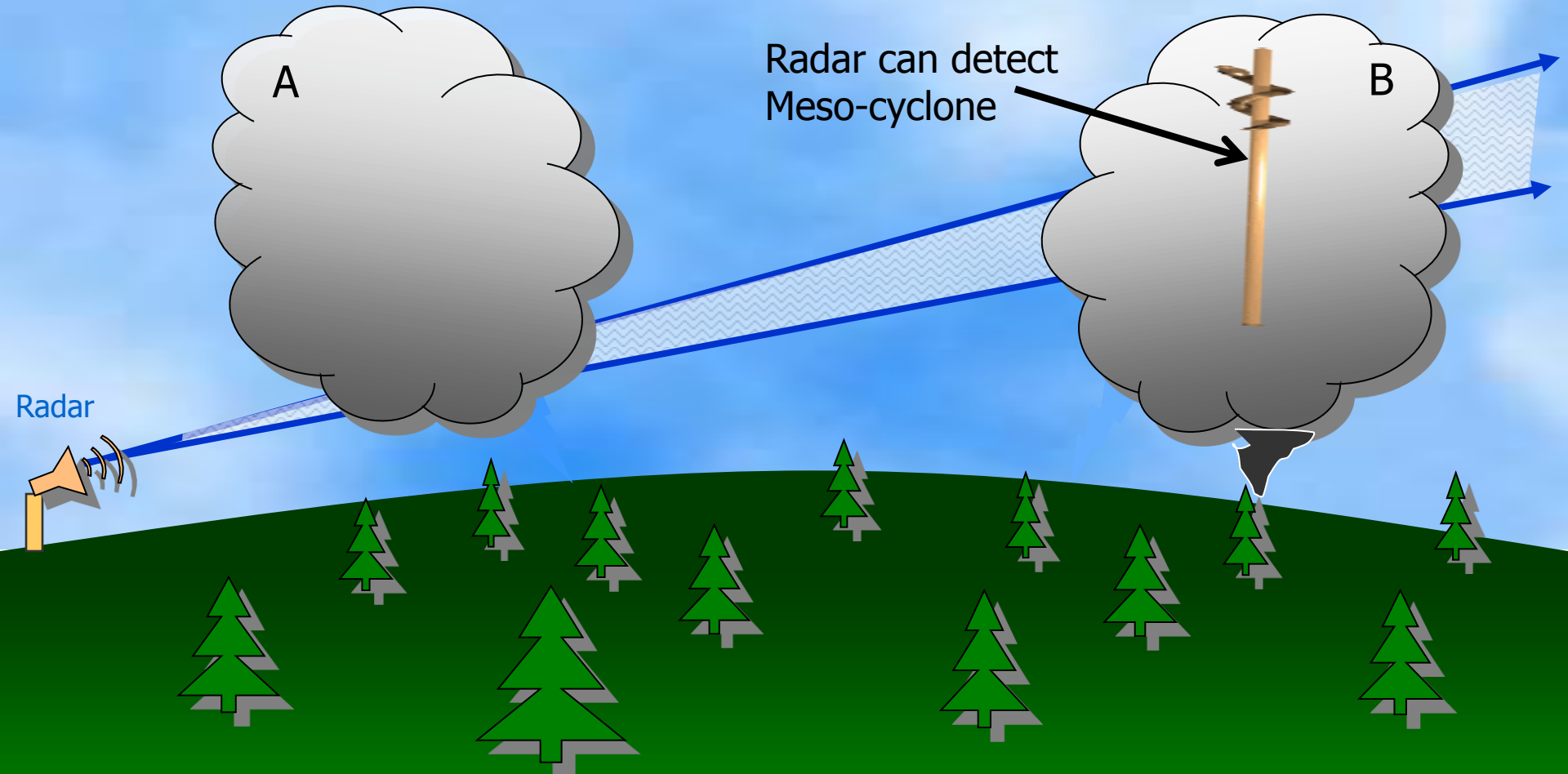
- *Provide ground-truth reports and observations*

We need (more) spotters!!

National Weather Service
Protecting Lives and Property

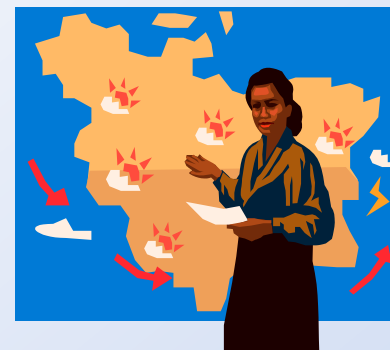
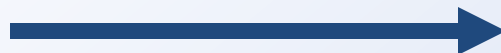


Radar Limitations



Radar beam cannot see lower portion of storm "B"

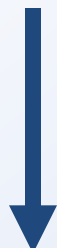
Getting Report to the NWS Office



TV

E-spotter

Hams -
radio



911

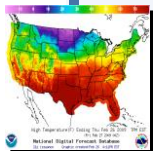


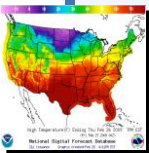
National Weather Service

800-545-8197 x468

Unlisted!!!!!!

National Weather Service
Protecting Lives and Property





weather.gov



National Weather Service Weather Forecast Office

Milwaukee/Sullivan, WI

Home Site Map News Organization Search for: NWS All NOAA Go

Top News of the Day

- Silent Key - For Devoted Ham Radio Operator
- Rain and Snow Sunday Night
- How Much Snow Has Fallen? (Updated 2-25-2011)
- Additional News Headlines

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Marine

Local forecast by "City, St" or Zip Code

City, St

XML RSS Feeds

Current Hazards

Watches/Warnings

Outlooks

Submit Report

Current Conditions

Observations

Radar

Satellite

Snow Cover

Snowfall Analysis

Forecasts

Forecast Discussion

Activity Planner

Aviation Weather

Fire Weather

Marine Weather

Severe Weather

Winter Weather

Hurricane Center

Hydrology

Rivers & Lakes

Precip Estimates

Climate

Local

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Drought

More...

Weather Safety

Preparedness

Weather Radio

StormReady

SkyWarn

Additional Info

Other Useful Links

Education Resources

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Top News Archives

Our Office

Click on the map below for the latest forecast.



Read watches, warnings & advisories Zoom Out

- Flood Warning
- Flood Advisory
- Special Weather Statement
- Hazardous Weather Outlook
- Hydrologic Outlook
- Short Term Forecast

Last map update: Sat, Feb. 26, 2011 at 2:04:38 pm CST

Latest Conditions in Milwaukee, WI

Feb 26 1:52 pm  **19°F** (-7°C)

Select A City:

Weather Story 

Radar 

Short Term Graphicast 

Satellite 


Weather Map 

Choose Your Front Page City

Select A City:

Local Historical Weather Events Search Page





National Weather Service Weather Forecast Office
Milwaukee/Sullivan, WI

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Outlooks
Submit Report
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Observations
Radar
Satellite
Snow Cover
Snowfall Analysis
Forecasts
Forecast Discussion
Activity Planner
Aviation Weather
Fire Weather
Marine Weather
Severe Weather
Winter Weather
Hurricane Center
Hydrology
Rivers & Lakes
Precip Estimates
Climate
Local
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Drought
More...
Weather Safety
Preparedness
Weather Radio
StormReady
SkyWarn
Additional Info
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Spotter Page

2011 Spotter Class Schedule


Outlook Graphics From The Storm Prediction Center - SPC

Watches




No Watches In Effect

Mesoscale Discussion




No Mesoscale Discussions In Effect

Day 1 Outlook



No Organized Severe Threat For


Day 2 Outlook



Day 3 Outlook



Day 4-8 Outlook



PREDICTABILITY TOO LOW

Submit a Storm Report

eSpotter - For trained and registered spotters

[Severe Weather Briefing Page](#)
[Winter Weather Briefing Page](#)

Don't Fall For The "Scary-Looking Cloud!"

[View Local Storm Report Graphic](#)
[View Local Storm Report Text](#)

On-line Report System

Register on our *eSpotter* page which can be reached from our SkyWarn Page ...after you have attended a spotter class

National Weather Service - eSpotter - Windows Internet Explorer

http://espotter.weather.gov/

National Weather Service - eSpotter

National Weather Service
eSpotter
Online Weather Reporting System

Home News Organization Search All NWS search Go

eSpotter
Main
Request Access
Online Training
Introduction
Access
Logon Screen
Main Menu
Left
Top
Center
Main Menu (hop)
Location
Create Report
Messages
Contact Us
or espotter@noaa.gov

New to eSpotter? [Register Here](#) [Registered Users: Log In](#)

Email Address:

Password:

[Forgot your password?](#)
[Click here.](#)

Connections made to this system are monitored. Your email address is used to verify that you are authorized to access this system, and to provide a means for contacting you to follow up on weather information you submit.

Announcement
For technical questions and problems, please contact:
[eSpotter Technical Support](#)

For other questions please contact your local weather forecast office. Please note that all offices listed below may not be listed on the registration page. This often means an office is coming online, and is not quite ready for spotters in the system. If you have questions about the status of eSpotter at an office listed below, contact the local office for more information.

eSpotter Weather Forecast Offices

Aberdeen, SD (ABR)	Albuquerque, NM (ABQ)	Amarillo, TX (AMA)
Atlanta, GA (FFC)	Austin/San Antonio, TX (EWW)	Billings, MT (BYZ)
Binghamton, NY (BGM)	Birmingham, AL (BMR)	Bozeman, ND (BDG)
Blackburg, VA (BRK)	Boise, ID (BOI)	Brownsville, TX (BRQ)
Buffalo, NY (BUF)	Charleston, WV (RLK)	Cheyenne, WY (CVS)
Chicago, IL (LOT)	Cleveland, OH (CLE)	Corpus Christi, TX (CRP)
Dallas/Fort Worth, TX (FWD)	Denver/Boulder, CO (BOU)	Des Moines, IA (DMQ)
Detroit, MI (DTX)	Dodge City, KS (DDC)	Duluth, MN (DLH)
El Paso, TX (EPZ)	Elko, NV (LKO)	Eureka, CA (EKA)
Flagstaff, AZ (FGZ)	Dayton, OH (APX)	Glasgow, MT (GOW)
Goodland, KS (GLD)	Grand Forks, ND (GOF)	Grand Junction, CO (GJT)

National Weather Service
Protecting Lives and Property



Scary-Looking Cloud Club

National Weather Service

Protecting Lives and Property

Click on "SkyWarn" link

National Weather Service Weather Forecast Office
Milwaukee/Sullivan, WI

Home Site Map News Organization Search for: NWS All NOAA Go

Local forecast by "City, St" or Zip Code
 City, St

XML RSS Feeds
Current Hazards
Watches/Warnings
Outlooks
Report
Conditions
Alerts
Radar
Satellite
Observed Precip
Forecasts
Forecast Discussion
Activity Planner
Aviation Weather
Fire Weather
Marine Weather
Severe Weather
Winter Weather
Hurricane Center
Hydrology
Rivers & Lakes
Climate
Local
National
Drought
More...
Weather Safety
Preparedness
Weather Radio
StormReady
SkyWarn
Additional Info
Other Useful Links
Education Resources
Coop Observer
Top News Archives
Our Office

Top News of the Day
• Another Tornado Added to July 22nd - updated Aug 16th
• La Nina - What does it mean for Milwaukee and Madison?
• How Hot Can It Get Inside a Closed Vehicle?

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Marine

Click on the map below for the latest forecast.

Read watches, warnings & advisories
Zoom In
Zoom Out

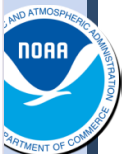
Flood Warning
Hazardous Weather Outlook

Last map update: Wed, Aug. 18, 2010 at 9:14:53 am CDT

Latest Conditions in Milwaukee, WI Choose Your Front Page City
Aug 18 8:52 am **68°F** (20°C)
Partly Cloudy
Select A City:

Weather Story Radar Satellite Weather Map

Local Historical Weather Events Search Page



Scary-Looking Cloud Club

Service
Property
National Weather Service
Protecting Lives

National Weather Service Weather Forecast Office
Milwaukee/Sullivan, WI

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Local forecast by
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 City, St
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Spotter Page

2010 Spotter Class Schedule

Graphics From The Storm Prediction Center - SPC

atches Mesoscale Discussion Day 1 Outlook

Day 2 Outlook Day 3 Outlook Day 4-8 Outlook

Submit a Storm Report
eSpotter - For trained and registered spotters

Severe Weather Briefing Page

Don't Fall For The "Scary-Looking Cloud!"

View Local Storm Report Graphic

Current Conditions
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StormReady
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SLC Club

Read entire story.
Some embedded links
have more info. There
are 5 pages of SLC
pictures

Local forecast by
"City, St" or Zip Code

City, St Go

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Top News Archives
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Contact Us
Contact Info
Feedback

Welcome To The "Scary-Looking Cloud" Club

To join, all you have to do is email rusty.kapela@noaa.gov and attach your favorite picture of a "Scary Looking Cloud," or SLC for short. Now is the time to join the SLC Club!

Due to an overwhelming response, we can only post the best ones. Hope you understand. Any picture you send to me automatically becomes part of the public domain - for free use by anyone. I will give you credit, as seen in the pictures below.

It would be greatly appreciated if you could reduce the size of your digital picture to something in the range of 500 x 600 prior to emailing it to me.

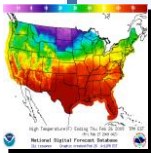
Scary-looking clouds are cloud fragments that briefly resemble funnel clouds or tornadoes and hang low at the base of the parent clouds. Due to hills and trees blocking your field of view, they may even appear to touch the ground. These kinds of clouds look **scary** to some people who might call them in as funnel clouds, or even tornadoes, to the 911 Dispatchers of the local Sheriff Department. This results in false funnel cloud or false tornado reports being relayed to the National Weather Service.

Most false tornado and false funnel cloud reports are associated with **shelf clouds**. Shelf clouds are a low-hanging, horizontal cloud feature attached to the front side of **lines of storms or even a single storm**. Usually there isn't any persistent rotation on a vertical axis within shelf clouds or within individual cloud fragments that extend downward from the shelf cloud, therefore they are just another scary-looking cloud. Shelf clouds often resemble snow plows, big waves, or tsunamis, and can be very scary-looking since they are usually low-hanging. Sometimes they may found only a couple hundred feet above the ground. There are two other phenomena that might resemble tornadoes or funnel clouds, but are not 1) dark rain shafts, or narrow columns of heavy rain, and 2) the white color of a hail shaft, a column of hail extending from the ground to the cloud base, may generate a light-dark contrast with surrounding rain, resulting in what might appear to be a funnel cloud or a tornado to the untrained eye.

Scary-looking clouds are the result of abundant moisture in the atmosphere and sufficient rising motion in the column of air between the ground and the predominate cloud base. The invisible water vapor quickly condenses into a visible cloud fragment which is subsequently raised up to the shelf cloud base.

Cloud fragments within the shelf cloud are rising into the thunderstorm base - this rising motion is referred to as an "updraft" in lines of storms. Shelf clouds can extend horizontally for many miles in length and are your visual indication that the downdraft portion of the thunderstorm line is approaching (behind the shelf cloud, relative to the storm motion). In lines of thunderstorms the updraft is on the forward side and the downdraft is on the backside of the line. The downdraft consists of three things: gusty winds, rain, and possibly hail. Tornadoes rarely develop under or near the shelf cloud because of the lack of persistent, organized, rotation on a vertical axis on the front side of the line of storms. The strongest of downdrafts are called "downbursts" which can produce hurricane-force, straight-line winds of 75 mph to over 100 mph at ground-level, torrential rains, and near-zero visibilities.

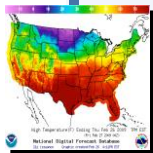
Generally, if the shelf cloud and storm are rapidly moving toward you then the gusty winds in the downdraft tend to be stronger. The shelf cloud develops in response to the rain-cooled air associated with the downdraft under-cutting and rapidly lifting up the lighter, warm, moist air found ahead of the line of storms. In Jerry's picture below, the scary-looking, funnel-shaped cloud was not rotating. Therefore it wasn't a true tornado. Actual tornadoes and funnel clouds rotate! If the scary-looking cloud you are looking at is not rotating, it's not a funnel cloud or a tornado, even if it looks like it's touching the ground or almost touching the ground!



NOAA Weather Radio All Hazards

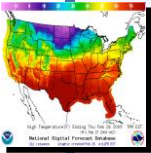
Your own personal siren - your home has a smoke alarm – does it have a weather radio?

- Receive weather information 24 hours a day
- Radio will sound a tone to alert you when a watch/warning has been issued
- Countless times, lives have been saved by NOAA Weather Radio



What do you Report?

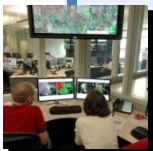
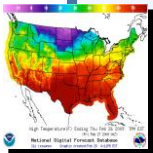
- Tornadoes/Waterspout – rotation? Damage?
- Funnel Clouds (nothing going on at the ground)
- Rotating wall clouds
- Hail stones - 1 inch in diameter or larger. Size of quarters (this is warning criteria). Will take $\frac{3}{4}$ inch and $\frac{7}{8}$ inch reports
- Thunderstorm wind gusts - 58 mph or higher (report tree/structural damage). Gusts \Rightarrow 58 mph generate Severe Thunderstorm Warnings
- Flooding – water over curb - covering a road, rainfall amounts \Rightarrow 1 inch
- Any kind of structural or vegetative damage



Tornado



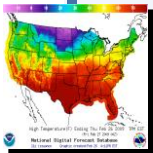
**Stoughton, EF3 Tornado
August 18, 2005**



Rotating Wall Cloud



Details covered in **Intermediate** slide set
in second half of this class



Funnel Clouds

- Funnel Clouds, by strict definition, do **NOT** come in contact with the ground, nor do they create a rotating dust/debris cloud at ground-level
- A true funnel cloud will ALWAYS be rotating



Doug Raflik



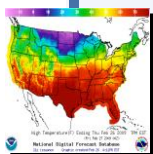
Tstm Wind Damage/Gusts

National Weather Service

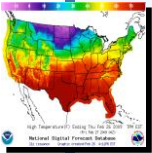
Protecting Lives and Property



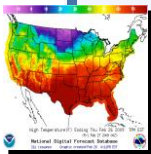
**Anemometer?
Give us your gust value!**



Hail



Flash Floods



General Report Format - TLCS

- **Time** event occurred?

- To the nearest minute

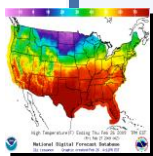
- **Location** of spotter (stationary spotter),

- GPS coords – decimal format to the 3rd decimal
- or referenced to the nearest city/village, to the nearest 1/10 mile (as the crow flies) and one of 16 compass directions

- **Condition** – what are you looking at or experiencing

- what is the event?

- * **Source** – some identification, ID letters, agency, etc.

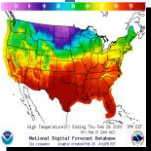


TLCS

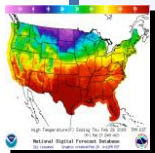
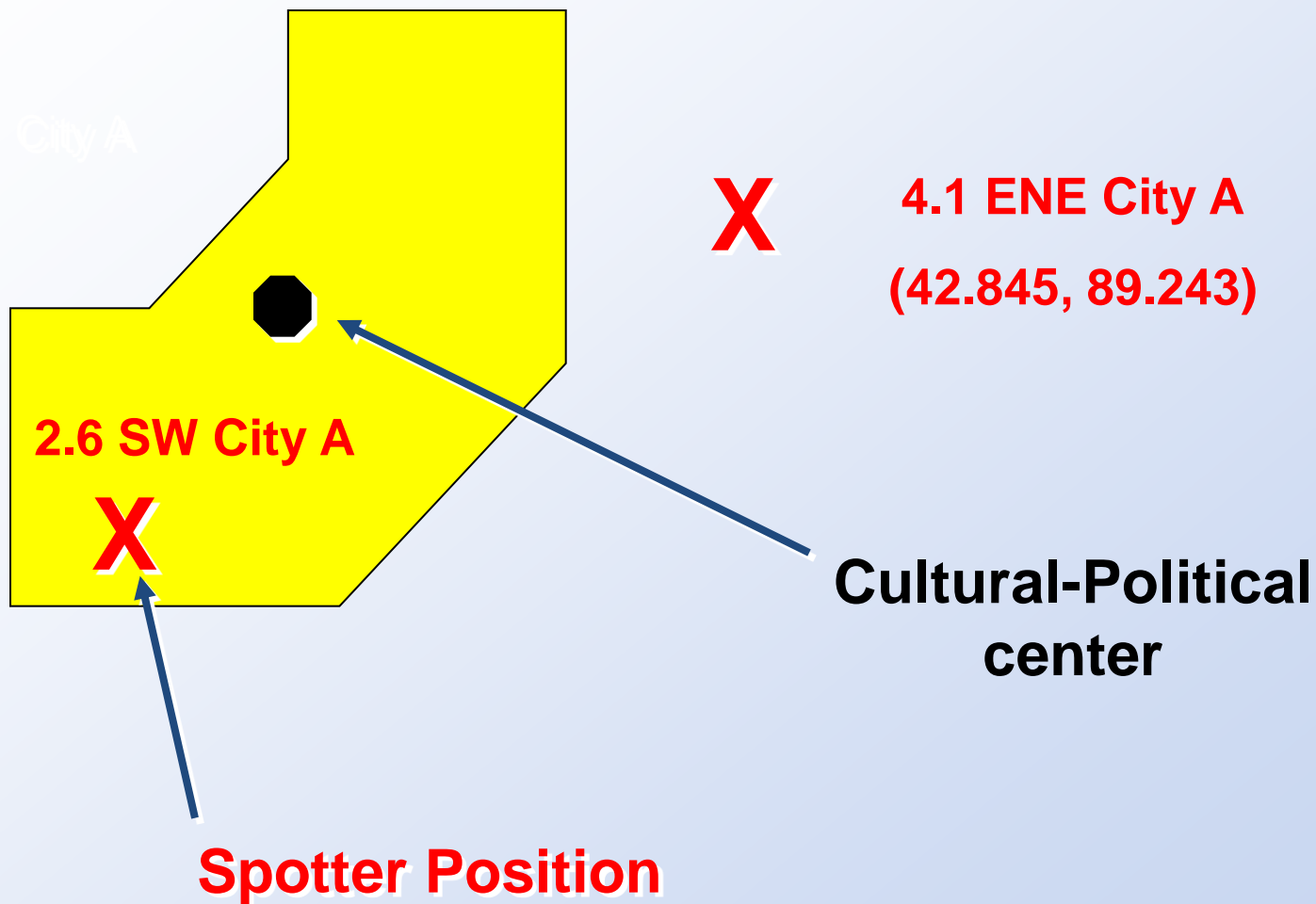


THE MAGIC BOARD.....

For posting family related messages and comments now contains the Skywarn reporting format at spotter Gabe Stelloh's household.



Reference Location

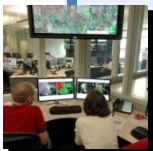
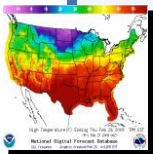


General 911 Report Format

- “Hello, I’m a trained severe weather spotter. At 4:05 pm, at a location 1.1 miles north of Saukville in Ozaukee County, I observed softball sized hail.” I’m estimating the hail size. My name is...

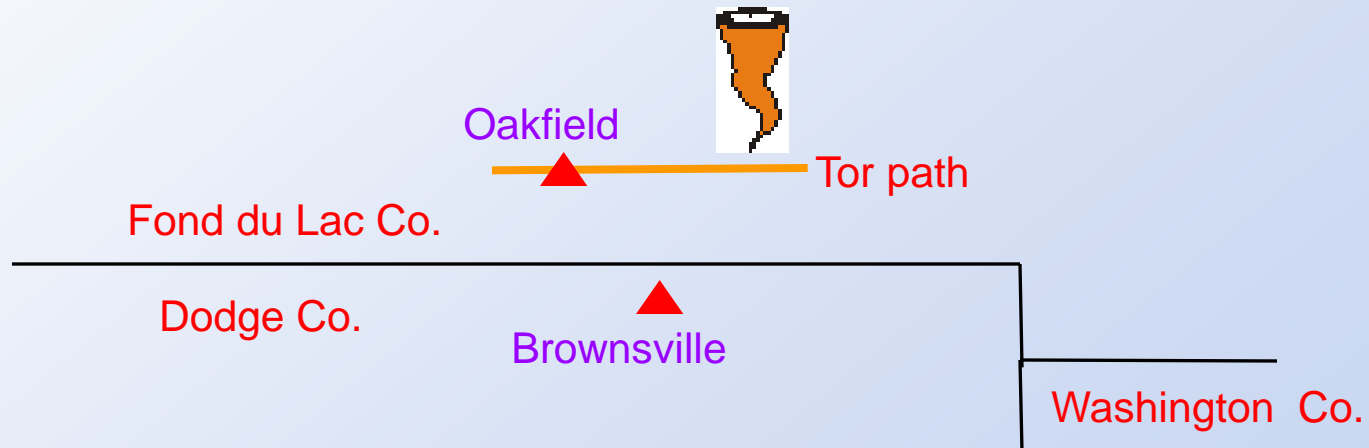
(Ham report format will be slightly different)

- Always mention if the size, speed, in your report is either estimated, or physically measured.

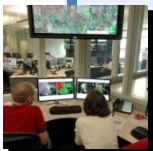
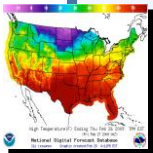


General 911 Report Format

- “Hello, I’m a trained severe weather spotter. It’s 630 pm. I’m located in Brownsville in Dodge County. I observed a tornado. Dodge County 911 Dispatcher tells NWS that tornado is in Brownsville.

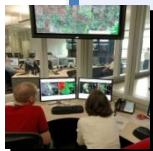
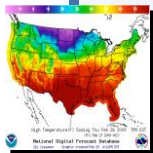


Spotter should have told dispatcher that tornado was to the north of them in Fond du Lac County.



Wisconsin Tornado Stats

- **Time** - most spin up between 3 pm and 9 pm, with 6-7 pm being the busiest.
- **Months** - most occur between April and September, with June being the peak month.
- **Movement** - generally SW to NE, but W to E, and NW to SE movements quite possible.
- **Rotation** – over 95% are cyclonic, but both rotations are equally destructive.



Combine Marquette
and Green Lake
County and you
get 52 tornadoes!



Tornado

Tornado: violently rotating column of air extending from the base of a **convective** cloud to the **ground**.



Tornado

Tornado in both pictures!



Note: Swirling debris at ground level in both pictures below.
Condensation funnel **doesn't** have to "touch" ground.

Fake Tornado

vice
arty

Grant County
May 31, 2008



Photo by Josh Roth
Guttenberg, IA Fire Dept.
May 31, 2008

What Do You See?

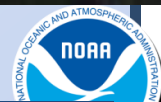
Oakfield, WI - July 18, 1996

- *Reached F5 intensity*
- *30 minute duration*
- *Maximum path width of 400 yards*
- *13.3 mile path length*
- *\$40.5 million in damages*
- *12 injuries*



Don Lloyd video

705-735 pm... people could see it, county fair in progress, and Oakfield police officers and fire fighters recognized when they had a tornado and activated their sirens...prior to the condensation funnel reaching ground



Scary-Looking Clouds!

Benjamin Rock WX9TOR
May 2009 Texas
Scary Looking Cloud (Updraft base)



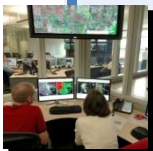
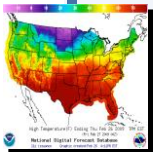
Cort Scholten
Holland, MI
July 16, 2008

Kelly Whitt
Sussex, WI
June 8, 2008



KSNTV

5.24.2005





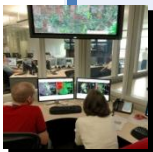
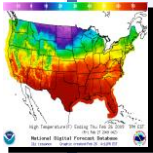
Quiz Time!



Tornado or Funnel Cloud?



National Weather Service
Protecting Lives and Property



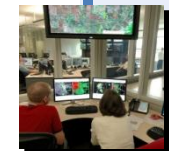
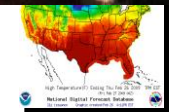
Tornado, Funnel or SLC?



Karla Dorman
Burleson, TX
June 3, 2007



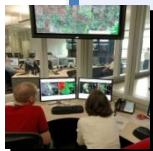
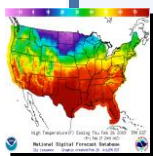
Jim Murphy
South-central WI
July 22, 2010



Personal Safety

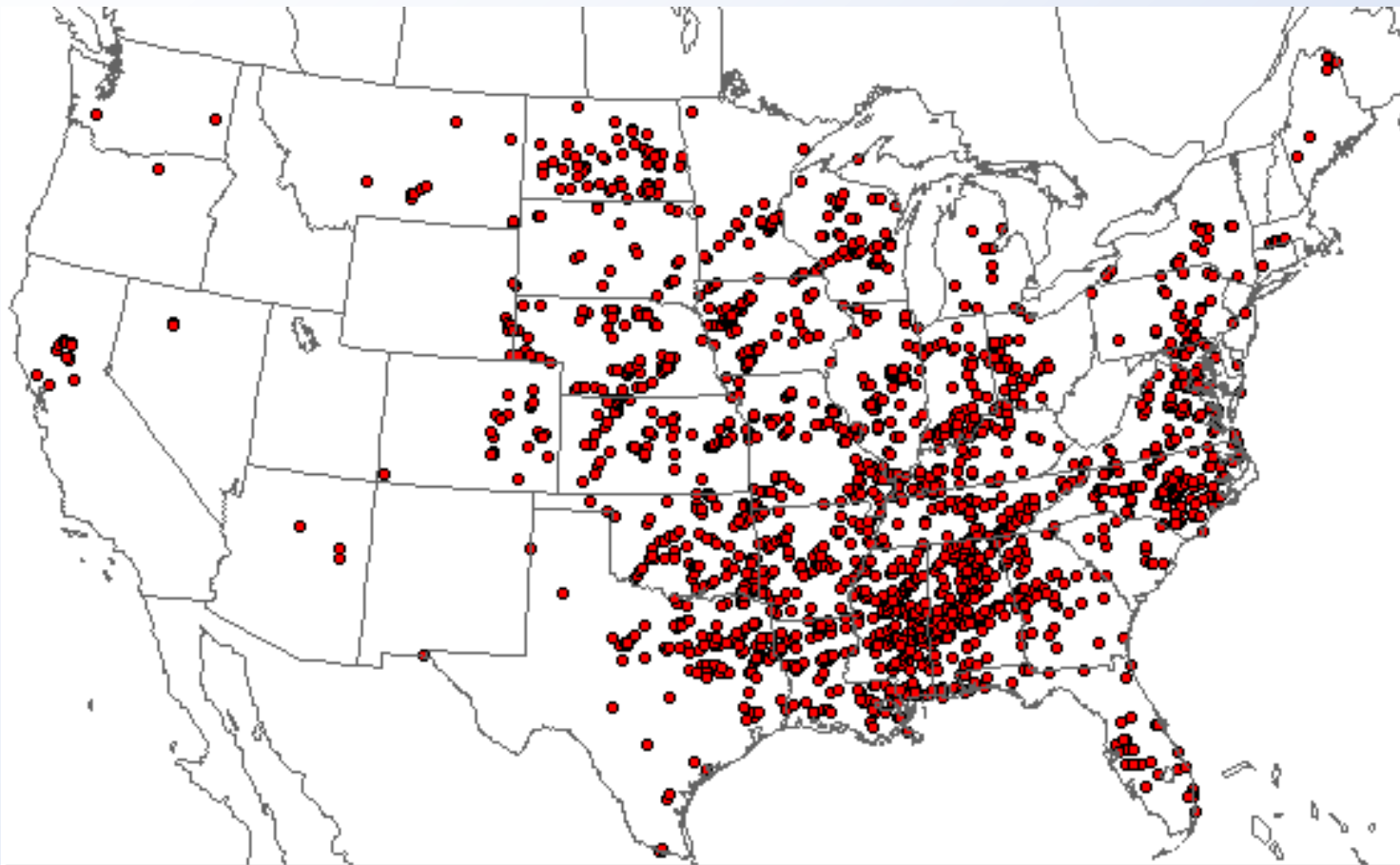


This was a weak tornado – what about a strong or violent tornado?



2011 U.S. Tornadoes

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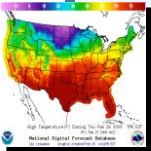


**PRELIMINARY SEVERE WEATHER
REPORT DATABASE (ROUGH LOG)**

NOAA/Storm Prediction Center Norman, Oklahoma

**Tornado Reports
January 01, 2011 - December 27, 2011**

Updated: Tuesday December 27, 2011 16:35 CT



End of Basic Class!!!

National Weather Service
Protecting Lives and Property

